

We claim:

1. A portable, manually-operated, wound cleansing liquid dispenser apparatus consisting of:

a manually-squeezable irrigation solution container for holding and selectively delivering sterile wound irrigation cleansing liquid, said container having a threaded neck;

5 a cap threadably engaging at said threaded neck, said cap carrying a nozzle from which said wound cleansing liquid issues as a jet in response to manual squeezing of said container, said cap defining a liquid flow path leading to said nozzle;

a splash shield surrounding said nozzle for protecting a user of said apparatus from splashing liquid; and

10 a valve disposed in said flow path for opening and closing said flow path.

2. The dispenser apparatus of claim 1 wherein said valve opens and closes said flow path in response to manual movement of said splash shield between a first and a second position.

3. The dispenser apparatus of claim 1 wherein said threaded neck of said container defines an external thread, and said cap including a collar portion internally defining a matching thread.

4 The dispenser apparatus of claim 3 wherein said matching thread of said cap has a minor diameter of substantially 1.347 inches, and a pitch dimension of substantially 0.164 inch.

5. The dispenser apparatus of claim 4 wherein said matching thread is a buttress configuration thread and has a first 90° radial surface and a second surface disposed at about 45° to said first surface.

6. The dispenser apparatus of claim 1 wherein said valve includes a valve member moving between respective first and second locations in response to manual movement of said splash shield between said first and second positions.

7. The dispenser of claim 6 wherein said cap defines a bore forming a part of said flow path and including a tapering bore section, said valve member including a tapering portion which in one of said first and second locations of said valve member sealingly engages on said tapering bore section.

8. The dispenser apparatus of claim 7 wherein said cap bore defines a shoulder disposed toward said container, said valve member including a stem portion having an end termination feature substantially aligned with said shoulder in said first position of said splash shield and in said respective first location of said valve member, an indicator member releasably
5 carried on said stem portion end termination feature and engaging said shoulder, whereby when said valve member is moved to said second location in response to manual movement of said splash shield to said second position, said indicator is dislodged from said end termination feature and is freed inside of said container.

9. The dispenser apparatus of claim 8 wherein said indicator is disk-like and brightly colored to be visible when freed within said container, whereby opening of said dispenser apparatus is irreversibly indicated by freeing of said indicator within said container.

10. The dispenser apparatus of claim 8 wherein said indicator is disk-like and includes a sufficient number of peripherally disposed circumferentially spaced apart projections for preventing said indicator from being retained by surface tension.

11. The dispenser apparatus of claim 8 wherein said disk-like indicator defines at least one flow notch, whereby said indicator is prevented by said flow notch from ever acting as a valve member preventing flow of liquid from said container via said cap.

12. The dispenser apparatus of claim 7 wherein said valve member further includes a plurality of axially extending legs for forming therebetween a part of said flow path in one of said first and second locations for said valve member.

13. The dispenser apparatus of claim 1 wherein said valve includes a non-reversion valve member which substantially prevents flow of liquid along said flow path from said nozzle toward said container.

14. The dispenser apparatus of claim 13 wherein said non-reversion valve member includes a resilient portion defining at least one slit, said slit opening in response to manual squeezing of said container and liquid flow therefrom toward said nozzle, said resilient portion bowing toward said container and closing said slit to substantially prevent liquid flow along said
5 flow path from said nozzle toward said container.

15. The dispenser apparatus of claim 13 wherein said cap further includes a passage extending between ambient and said irrigation solution in said container, a pressure responsive aspiration valve disposed in said passage for allowing ambient air to enter said container when a sub-ambient pressure exists therein.

16. The dispenser of claim 15 wherein said cap defines plural said passages annularly arrayed and circumferentially spaced apart, and said valve includes an annular resilient disk valve member.

17. The dispenser apparatus of Claim 1 wherein said splash shield member is separable from said cap in said first position.

18. The dispenser apparatus of Claim 17 in which said valve member prevents dispensing of liquid from said container via said cap when said splash shield is separated from said cap.

19. The dispenser apparatus of Claim 18 wherein said cap defines a bore forming a part of said flow path and including a tapering bore section, wherein said valve includes a manually-operated valve member moving between respective first and second locations in response to manual movement of said splash shield between said first and second positions; said
5 manually-operated valve member including a tapering portion which in one of said first and

second locations of said manually-operated valve member sealingly engages on said tapering bore section; and wherein said splash shield is defined by a splash shield member also including a stem portion sealingly receivable into said bore of said cap in said second position of said splash shield, said splash shield member stem including an end feature engaging against said manually-operated valve member in said second position of said splash shield to prevent said manually-operated valve member from engaging against said tapering section of said bore, whereby said apparatus may discharge pressurized liquid from said nozzle in response to manual squeezing of said container only so long as said splash shield member stem portion is sealingly received into said bore of said cap.

20. The dispenser apparatus of Claim 6 wherein said cap defines a bore forming a part of said flow path and including a tapering bore section, wherein said valve includes a manually-operated valve member moving between respective first and second locations in response to manual movement of said splash shield between said first and second positions; said manually-operated valve member including a tapering portion which in one of said first and second locations of said manually-operated valve member sealingly engages on said tapering bore section; and wherein said manually-operated valve member further includes a plurality of axially extending legs for forming therebetween a part of said flow path in one of said first and second locations for said manually-operated valve member; wherein said valve also includes a non-reversion valve member which substantially prevents flow of liquid along said flow path from said nozzle toward said container, said plurality of valve member legs of said manually-operated valve member extending toward engagement with said non-reversion valve member; and wherein said manually-operated valve member is also responsive to pressurized liquid resulting from squeezing of said container to sealingly engage against said tapering section of said bore so as to also serve as a safety valve by moving to one of said first and second locations and into sealing engagement with said tapering bore section so as to prevent liquid flow along said flow path, whereby in the event that said splash shield is absent from said dispenser apparatus then liquid flow from said container via said cap is prevented.

21. The dispenser apparatus of Claim 20 wherein said splash shield is defined by a splash shield member also including a stem portion sealingly receivable into said bore of said cap in a second position of said splash shield, said splash shield member stem including an end feature engaging against said manually-operated valve member to prevent said manually-operated valve member from engaging against said tapering section of said bore, whereby said apparatus may discharge pressurized liquid from said nozzle in response to manual squeezing of said container only so long as said splash shield member stem portion is sealingly received into said cap bore.

22. The dispenser apparatus of claim 20 wherein said cap further includes a passage extending between ambient and said irrigation solution in said container, a pressure responsive aspiration valve disposed in said passage for allowing ambient air to enter said container when a sub-ambient pressure exists therein.

23. The dispenser of claim 22 wherein said cap defines plural said passages annularly arrayed and circumferentially spaced apart, and said valve includes an annular resilient disk valve member.

24. A dispenser cap for combination with a standard irrigation solution bottle to make a portable wound irrigation dispenser for discharging a cleansing liquid jet when the bottle is inverted and manually squeezed, said cap comprising:

a collar portion defining a female thread matching the thread on said standard irrigation solution bottle;

a wall portion spanning an end of said cap opposite to said bottle;

a tubular neck section extending from said wall and defining a through bore defining a flow path communicating irrigation solution from said bottle;

a splash shield member carried by said tubular neck section and including a nozzle for directing said jet of cleansing liquid; and

a valve for opening and closing said flow path.

25. The dispenser cap of claim 24 wherein said splash shield member is manually movable axially between a first and a second position, and said valve opens and closes said flow path in response to movement of said splash shield member between said first and said second positions.

26. The dispenser cap of claim 24 wherein the container includes a threaded neck defining an external thread, and said cap collar portion internally defines a matching thread; wherein said matching thread has a minor diameter of substantially 1.347 inches, and a pitch dimension of substantially 0.164 inch.

27. The dispenser cap of claim 24 wherein said valve includes a valve member moving between respective first and second locations in response to manual movement of said splash shield between said first and second positions; and said cap includes an axially extending tubular neck portion defining a through bore forming a part of said flow path and including a
5 tapering bore section, said valve member including a tapering portion which in one of said first and second locations of said valve member sealingly engages on said tapering bore section.

28. The dispenser cap of claim 27 wherein said cap bore defines a shoulder disposed toward an open end of said cap, said valve member including a stem portion having an end termination feature substantially aligned radially with said shoulder in said first position of said splash shield member and in said respective first location of said valve member, an indicator
5 member releasably carried on said stem portion end termination feature and in a first location of said valve member engaging said shoulder, whereby when said valve member is moved to said second location in response to manual movement of said splash shield to said second position, said indicator is dislodged from said end termination feature and is freed inside of said container, thus irreversibly indicating that the apparatus has been used.

29. The dispenser cap of claim 28 wherein said indicator is disk-like and defines at least one flow notch, whereby said disk-like indicator is prevented by said flow notch from ever acting as a valve member preventing flow of liquid from said container via said cap.

30. The dispenser apparatus of claim 28 wherein said indicator includes a sufficient number of peripherally disposed circumferentially spaced apart projections for preventing said indicator from being retained by surface tension.

31. The dispenser cap of claim 24 wherein said valve member further includes a plurality of axially extending legs for forming therebetween a part of said flow path in one of said first and second locations for said valve member; and said cap further includes a non-reversion valve member disposed across said bore and substantially preventing flow of liquid
5 along said flow path from said nozzle toward said bottle.

32. The dispenser cap claim 31 wherein said non-reversion valve member includes a resilient wall portion spanning said bore and defining at least one slit, said slit opening in response to manual squeezing of said container and liquid flow therefrom toward said nozzle, said resilient portion bowing toward said container and closing said slit to substantially prevent
5 liquid flow along said flow path from said nozzle toward said container.

33. The dispenser apparatus of claim 32 wherein said cap further includes a passage extending between ambient and said irrigation solution in said container, a pressure responsive aspiration valve disposed in said passage for allowing ambient air to enter said container when a sub-ambient pressure exists therein.

34. The dispenser of claim 33 wherein said cap defines plural said passages annularly arrayed and circumferentially spaced apart, and said valve includes an annular resilient disk valve member.

35. The dispenser cap of Claim 24 wherein said splash shield is defined by a splash shield member also including a stem portion sealingly receivable in said second position of said splash shield into said bore of said cap, said stem of said splash shield member including an end feature engaging against said manually-operated valve member in said second position of said
5 splash shield to prevent said manually-operated valve member from engaging against said tapering section of said bore, whereby said apparatus may discharge pressurized liquid from said

nozzle in response to manual squeezing of said container only so long as said stem portion of said splash shield member is sealingly received into said bore of said cap.

36. A method of providing a dispenser cap for combination with a standard irrigation solution bottle to make a portable wound irrigation dispenser, the portable wound irrigation dispenser being useful for discharging a cleansing liquid jet into a wound when the bottle is inverted and manually squeezed, said method comprising steps of:

- 5 providing a collar portion defining a female thread matching the thread on said standard irrigation solution bottle;
- spanning one end of said collar portion with a wall portion to said bottle;
- extending a tubular neck section axially from said wall portion and forming in said neck section a through bore defining a flow path communicating irrigation solution from said bottle;
- 10 providing a splash shield member disposed upon said tubular neck section and including a nozzle for directing a jet of cleansing liquid, providing for said splash shield member to be manually movable relative to said collar portion between a first and a second position; and
- including in said flow path a valve for opening and closing liquid flow therein in response to movement of said splash shield member between said first and said second positions.

37. The method of claim 36 further including the steps of:

- providing for said cap collar portion to internally define a thread;
- configuring said thread with a minor diameter of substantially 1.347 inches, and a pitch dimension of substantially 0.164 inch.

38. The dispenser cap of Claim 36 further including the steps of;
- providing for said dispenser cap to carry in indicator disposed within said bottle; and
 - in response to movement of said splash shield member between said first and said second positions releasing said indicator from said dispenser cap within said bottle, thus irreversibly
 - 5 indicating that the wound irrigation apparatus has been used.